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BOX FOR STORING AND DISPENSING CABLE

This application claims the benefit of Provisional Application No. 60/262253, filed January 17, 2001.

FIELD OF THE INVENTION

The present invention relates to a box construction designed to contain a spool of wire or cable for smoothly dispensing such wire or cable in measured amounts.

BACKGROUND OF THE INVENTION

It is common today to sell wire and cable for industrial and commercial use mounted on spools. The spools generally have a drum-like configuration. However, such a spool shape alone is not always convenient for feeding measured amounts of cable. In addition, spools provide no substantial protective covering for the cable, nor do they provide an omni-directional, stable, stackable package. Additionally, conventional spool packaging heretofore in use is comparatively expensive to make an is at a competitive disadvantage in sales against wire sold without being spool wrapped.

SUMMARY OF THE INVENTION

Embodiments of aspects of the present invention provide an improved apparatus for storing and dispensing cable or wire.

One illustrative embodiment of the invention provides a simple packaging system for wire or cable that permits wire or cable to be stored safely with the cable protected, while at the same time permitting measured amounts of the cable to be fed from the spool for subsequent use. It is noted that the terms wire and cable are used interchangeably herein.

In another illustrative embodiment of the invention a simple packaging system is provided for wire and cable that facilitates the installation of cable under a wide range of conditions. In particular, the present invention provides a convenient means for storing and moving cable and at the same time permits the easy pay out of measured amounts of cable in a manner which is efficient to a cable installer.

An advantage of the present invention is that it provides a means for storing cable in a relatively inexpensive package designed to support cable on a spool.

A further advantage of an embodiment of the present invention is to provide an improved means of paying out cable at a steady rate, avoiding tangling and backlash of the cable.

In yet another illustrative embodiment of the invention, a box for dispensing cable is provided. The box comprising a pair of opposed, rectangular side walls, a front wall adjacent to each of the pair of side walls, a back wall adjacent to each of the pair of side walls and opposite from the front wall, a top wall adjacent to each of the pair of side walls, with the front wall and the back wall and a bottom wall adjacent to each of the pair of side walls and opposite the top wall. The box also includes a panel in a wall of the box adapted to be displaced to provide an opening in the wall with a cable spool support located in the box. The cable spool support includes journals to support a spool of cable for dispensing cable from the spool in the box. One embodiment is formed entirely of cardboard, folded in a manner to provide a pair of opposed sturdy journals.

Further features and advantages of the present invention, as well as the structure and operation of various embodiments of the present invention are described in detail below with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is described with reference to the following drawings, in which similar reference numbers indicate similar structures.

Figure 1 is a perspective view of a cable box showing an embodiment of the invention as it would be received by a user;

Figure 2 is a perspective view of the embodiment of Figure 1, with cable being dispensed from a large opening;

Figure 3 is a perspective view of the embodiment of Figure 1, with cable being dispensed from a handle opening;

Figure 4 is a perspective view of a spool of cable positioned on two internal components of an embodiment of the invention forming journals for the spool;

Figure 5 is a plan view of a die cut single sheet of cardboard used to construct a box and rigid supports;

Figure 6 is a cutaway view showing a box and rigid supports forced from a single sheet of cardboard;

Figure 7 is a perspective view of the invention, showing a first flap of the top wall in a closed position and a second flap of the top wall in an open position;

Figure 8 is a perspective view of the invention, showing both the first flap and the second flap of the top wall in an open position;

Figure 9 is another view of the invention, showing a cable retainer forming a part of the invention;

Figure 10 is a view of yet another aspect of the invention, showing a integral cable lock.

DETAILED DESCRIPTION OF THE DRAWINGS

The present invention will be better understood upon reading the following detailed description of various embodiments of aspects thereof in connection with the drawings.

The present invention comprises a box preferably formed of heavy duty corrugated cardboard or other relatively stiff cardboard or other material which is rugged, capable of supporting heavy contents, and typically used for shipping spools of wire and cable. Cardboard is generally preferred because it allows the box to be made at a lower cost. The box is preferably formed as a six-sided container having a rectangular side wall 1 and an opposite side wall of equivalent dimensions and parallel to it, as well as front wall 2 with a corresponding parallel back wall at the other end, and a top wall 3 with a corresponding bottom wall parallel thereto. The box may be conveniently formed with the top 3 being a lockable cover. The front wall 2 illustrated in Figures 1 and 2 is formed with a die-cut, removable panel 10 which can be removed along a perforated line 10A. A portion 10B of the panel 10 may be folded inwardly along crease line 10C within the box lying adjacent to the spool 26 of cable. This may be done such that the panel 10 frictionally engages the spool 26 or such that the panel 10 serves to reinforce the upper edge of the opening 11 which may be used as a handle for the box. The edges of the panel 10 may be conventionally die cut intermittently so that it will remain in planar alignment with the wall 2 unless moved relative thereto under a positive force. The upper edge may be scored or die cut depending on whether the panel is to be removed completely or folded inwardly.

The top 3 of the box is also provided with a die-cut opening 15 forming a handle grip. The die-cut handle opening 15 extends laterally across the top of the box and may

be provided with an enlarged center-cut segment 16 for ease in removing the portion of the top 3 to form the handle opening 15. This center-cut section may also be used to dispense cable without removing the die cut portions of the handle as is shown in Figure 3. It may alternatively be diecut in a similar fashion to panel 10 with only one side forming a large scored section.

The relative dimensions of the box are best illustrated in Figure 2. For example, when used for a conventional spool of electrical wire sold for industrial or installation purposes in bulk, a box suitable for on site installations may comprise a box with outer dimensions on the order of 8" wide, 14" long and 14 ½" high, respectively represented as dimensions A, B and C in Figure 2. These outer dimensions may, of course, vary depending on the precise size of the spool to be contained. The panel 10 should preferably have dimensions on the order of about 8" long and 5 ½" wide, respectively shown as dimensions F and G in Figure 2. The handle opening 15 may vary in size depending on the size of the spool but preferably should be 5 ½" wide and about 2" deep as represented by D and E in Figure 2.

Positioned within the box is an interior support, with its relative position within the box illustrated in Figure 4. The interior support is preferably formed of two opposed rigid supports 18. These rigid supports 18 may comprise STYROFOAM (expanded plastic made from polystyrene) or other rigid plastic elements made through a molding, blow forming, or other plastic forming process. Alternatively, the rigid supports may also be comprised of internal panels of cardboard that may be integrally formed from the same sheet of cardboard used to form the box. The supports are positioned parallel to one another on the inner surfaces of the side walls 1 in a spaced relation. Each support is formed of board approximately one inch thick in the embodiment illustrated in Figure 4, with length and width dimensions sized to occupy the width and height of the box. In the illustrated embodiment, the supports here are "U"-shape. The supports 18 are each formed with an integrally defined journal to function as an axle or spindle support 20 in the preferred embodiment. The spindle supports 20 are formed as an elongated opening extending from the upper edges of the supports 18 downwardly from the top 3 of the box towards the bottom edge of the box. The edges 22 form the side edges of the journals while the bottoms 23 forms the bottom edges of the journals. In the illustrated embodiment, the journal of each support is defined by the bight of the "U"-shape. The edge 22 is positioned closer to the bottom of the box than to the top of the box. By

spacing the facing edges 22 a distance on the order of five inches apart, a variety of different sized spindles for spools 26 of wire and cable may be accommodated. A spool 26 of wire or cable 25 is conventionally formed with a spool 26 supported on a spindle 24 with the spindle 24 preferably integrally formed within the spool and having a diameter of less than five inches or less than the space between the opposite edges 22 of each side 18. Alternative embodiments may incorporate a spool that is separate from a spindle.

Figure 5 illustrates a plan view of one embodiment of the invention where both the box and the rigid supports 18 are formed from one sheet of cardboard. The figure shows the sheet of cardboard after it has been cut but before it has been glued and folded to form a box with integral rigid supports. The rectangular side walls 1, the end wall 2, and the top wall 3 are numbered in Figure 5 such that they correspond to the numbered sides shown in Figures 1, 2, and 3 which show a box in the assembled state. Solid lines in this drawing represent complete cuts in the cardboard while dashed lines represent either fold lines or perforation lines where panels may be removed if desired. Figure 6 shows a cutaway view of box formed from the sheet of cardboard shown in Figure 5. To form the box, the following steps are taken. The sheet is folded along crease lines 2A, 1A between the panels defining the front 2, the back, the side walls 1, and the bottom. Then too, 41A forming a portion of the bottom is glued to tab 41B, 42A is glued to tab 42B and 43A is glued to tab 43B. Tabs 41A, 41B, 42A and 42B form the bottom when secured together. The sheet now has an elongated box form without a top. The next step involves folding panels 44 which are connected to the upper edge of the side panels 1 by crease lines 44A and folding them into the internal cavity of the box. These internal panels 44 as illustrated in Figure 5 each have spacers 46 that integrally connect along crease lines 44B along the edges remote from side panel 1. Each spacer 46 includes a center section 46A and end sections 46B and 46C. The end sections are connected to the center sections along crease lines 46D. These end sections 46B and 46C are folded over the center section 46 into a sandwich-like configuration. Thus assembly of the sandwich-like configuration is folded against the internal panel 44 between the panel 44 and the side wall 1. When so folded the unfolded longitudinal edge of the sandwich-like configuration is aligned with the lower edge 50 of rectangular opening 51. When assembled the configuration provides a rigid formal support 52 as illustrated in FIG. 6, having at least four thicknesses of cardboard that will function to support the spindle of a

spool of wire. Figures 7 and 8 illustrate the details of the top wall 3 of the box. The top wall provides a secure means to keep the box closed and also improves the structural rigidity of the box. The top wall 3 includes a first top flap 31 and a second top flap 32. To close the lockable cover, the first flap 31 is moved into the position shown in Figure 7. Here, the tab at the distal end of the first flap is tucked into an interior portion of the box. Next the second flap 32 is folded over the first flap to a position like that shown in Figure 1. The three flap locks 34 are then tucked into an interior position of the box. The three corresponding locking tabs 35 are then placed through the flap locks 34 to hold the top wall 3 rigidly in place. Such a rigid connection is particularly important when a handle is included in the top wall 3 of the box. Various locking tabs may be incorporated through the invention to hold the various components in place.

As illustrated in Figures 2 and 3, the spool 26 with the cable 25 is pre-packaged within the box. The free end of the cable 25 may be drawn or fed from the box either through the handle opening 15 as illustrated in Figure 3 or, alternately, through the large opening 11 as shown in Figure 2, depending upon the particular needs and desire of the user of the box. Figure 7 shows a retainer that may be used to hold the free end of the cable 25 in place during shipment. The retainer is an elongated rubber band 17, but alternatively could be comprised of different materials including an elastic fabric, a non-elastic fabric, a plastic material, a cord or any similar materials know to those in the art. A first end 17A of the band is fastened to the cable approximately 6 inches from the free end 25A of the cable 25. A second end 17B of the band is then stretched around the spool in the same direction as the cable. After one complete revolution, the second end is looped around the free end of the cable which serves to lock the free end in place. The band has the added benefit of making the free end of the cable easy to located and remove. To remove the cable from the box, one only has to locate the band and pull or rotate it until it leads to the free end of the cable. Pulling the band in the vicinity of the cable free end allows the second end of the band to free itself from the cable. A continued pulling force will cause the spool to rotate until cable is being dispensed. Once cable has been dispensed, the band can easily be removed from the cable.

One aspect of the invention includes a cable lock 19 that can be used to hold the free end of the cable. This lock 19 is illustrated in Figure 10. The lock would likely be used when only a portion of the cable in the box has been dispensed and the remaining portion is stored. In such a situation, the free end of the cable is wedged between the die

cut handle opening 15 and the corresponding portion of the box. The wedging action locks the cable in place until it needs to be dispensed again.

While the invention has been described in conjunction with specific embodiments thereof, it is evident that many alternatives, modifications and variations will be apparent to those skilled in the art. Accordingly, embodiments of the invention as set forth herein are intended to be illustrative, not limiting. Various changes may be made without departing from the invention.

What is claimed is: